NEW TERMITES FROM CENTRAL AND SOUTH-EAST AUSTRALIA.

By Gerald F. Hill.

(Twenty-one Text-figures.)

[Read 28th March, 1923.]

One new species of *Coptotermes* and two new species of *Eutermes* are described in this paper. With these additions to the list of Australian species, the former genus now contains six species and the latter twenty-eight species and one variety.

I am indebted to the Authorities of the South Australian Museum and to Messrs. W. W. Froggatt, F. E. Wilson and W. F. Hill for the privilege of examining the material herein discussed.

The methods of recording measurements and colours are the same as those referred to in previous papers. The Text-figures were drawn by the writer with the aid of a camera lucida and are from specimens in the type series.

Coptotermes sedulus, n.sp. (Text-figs. 1-7.)

Imago. (Text-figs. 1-4.)

Colour: Very dark brown, head and pronotum darkest, legs and wing veins a little lighter than tergites of abdomen. Antennae brown, first two joints very dark. Wing membrane fuliginous.

Head (Text-fig. 1) rather small, moderately setaceous, rounded on the sides and behind, front flattened; fontanelle very small, oval; ocelli large, oval, well separated (0.048) from the eyes; eyes large (0.272 x 0.304), prominent, finely faceted, lower margin separated from the lower (lateral) margin of the head by a space of 0.329; Post-clypeus short, one-fourth as long as wide, light brown like tarsi; anteclypeus large, hyaline, anterior margin slightly produced in the middle; labrum large, rounded on the sides and in front; antennae (Text-fig. 2) 19-jointed, 1st joint large, a little swollen at apex, 2nd half as long as 1st and much narrower, 3rd very short, less than half as long as 2nd and much narrower, smallest of all, 4th and 5th globose, equal.

Thorax: Pronotum (Text-fig. 3) nearly as wide as head, concave in front, rounded on the sides, slightly sinuate behind, moderately setaceous like head; posterior margin of meso- and metanotum slightly more rounded than pronotum.

Legs moderately short and slender, claws and tibial spurs large and dark coloured, tarsi pale coloured, fourth tarsal long and slender, longer than remaining joints together.

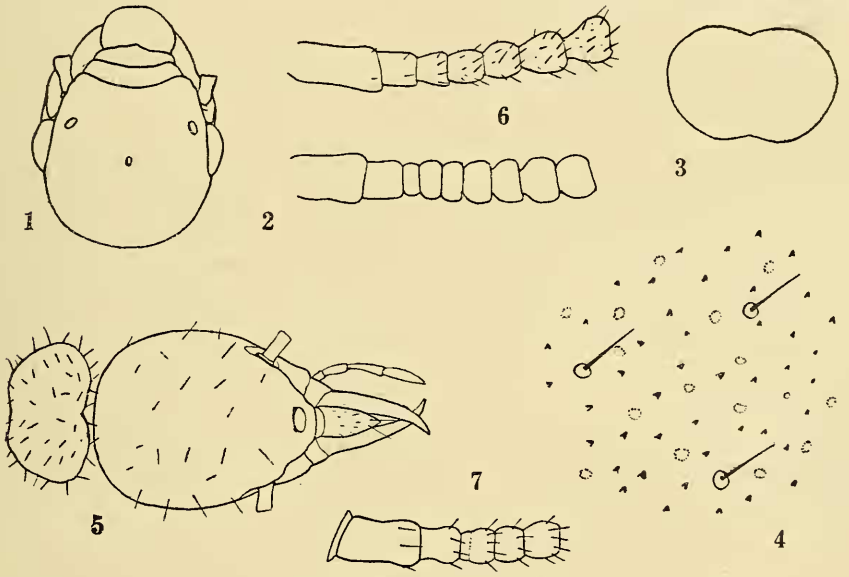
Wings: Wing-stumps setaceous as in pronotum, distal margin convex; membrane clothed with setae and densely but minutely sculptured (Text-fig. 4); costal, apical and distal half of the posterior margin very setaceous; costa and radius dark and very distinct, the latter setaceous to the apex of the wing and sometimes obscurely branched towards the former, or to the median vein, or to the apex; median vein very distinct at the base but soon becoming invisible, that of the forewing branching within the wing-stump, that of the hindwing beyond the suture; cubitus with a varying number of branches, forked or simple, only the proximal short branches distinctly visible.

Abdomen cylindrical, bluntly rounded at the apex, tergites clothed as in pronotum; cerci short and moderately stout.

Measurements:

Length with wings 15.00 mm.; without wings 8.00.

Head: from posterior margin to apex of labrum, long 1.36; from posterior



Coptotermes sedulus, n.sp.

Text-figs. 1-4. Imago.—1. Head from above; 2. antenna, proximal segments; 3. pronotum; 4. wing-membrane (greatly magnified).
Text-figs. 5-6. Soldier.—5. Head and pronotum; 6. antenna, proximal segments.
Text-fig. 7. Worker.—Antenna, proximal segments.

margin to clypeo-frontal suture, long 0.94; at and including eyes, wide 1.18.

Antennae (19-jointed), long 1.92.

Pronotum, long 0.70; wide 1.03.

Tibia iii., long 1.00.

Wings: forewings, long 11.00; wide 3.15; hindwings, long 10.50; wide 3.30.

Abdomen, wide 1.55.

Soldier. (Text-figs. 5-6.)

Colour: Head and antennae ochraceous, mandibles castaneous, pronotum bordered with yellow, legs and abdomen yellowish-white, the latter, as well as

meso- and metanotum, with an indistinct brown pattern along the dorso-median line.

Head (Text-fig. 5) widest midway between base and fontanelle, rounded behind and on the sides, sloping in from the posterior margin of the antennal fossae to the base of the mandibles, with scattered long reddish setae; fontanelle relatively large (0.175 diam.), with dark coloured dorsal margin; anteclypeus hyaline; labrum long and narrow, acuminate; antennae (Text-fig. 6) 16-jointed, the 1st long and moderately slender, 2nd about two-fifths as long as 1st and much narrower, 3rd shortest of all, narrowed at the base, 4th as long as 2nd, oval. 5th as long as 4th, more rounded, 6th much larger and more stalked than 5th, 7th turbinate.

Thorax: Pronotum (Text-fig. 5) small and much narrower than head, deeply emarginate in front, slightly sinuate behind, the margin yellow, the whole upper surface with scanty reddish setae as on head; mesonotum about as wide as pronotum, metanotum slightly wider, clothing and posterior margin of each similar to pronotum.

Legs rather stout, clothed with numerous long and short reddish setae.

Abdomen elongate, bluntly rounded at the apex, the segments clothed similarly to the legs; cerci large.

Measurements of:

	C. sedulus	*C. lacteus*	*C. michaelseni.*
Total length	5.30	—	4.30*
Head, with mandibles, long	2.02	2.50	1.30
„ , posterior margin to labral suture, long	1.36	1.60	—
„ , posterior margin to anterior margin of fontanelle, long	1.27	1.41	1.22
„ , wide	1.12	1.18	0.96
Thorax and abdomen, long	3.66	—	—
Antennae, long	1.64	—	1.30
Pronotum, long	0.47	0.47	—
wide	0.82	0.89	—
Mesonotum, wide	0.84	—	—
Metanotum, wide	0.94	—	—
Tibia iii., long	1.03	1.12	0.84
Abdomen, wide	1.17	—	—

Worker. (Text-fig. 7.)

Colour: Head yellow with ferruginous spot at postero-lateral angles of clypeus, remainder of insect almost uniform pale straw; head, thorax, abdomen and legs clothed with long and short, conspicuous, reddish setae.

Head large, basal half from posterior margin of antennal fossae almost hemispherical, the widest part in line with the insertion of the antennae; postclypeus large, anterior and posterior borders arcuate; labrum strongly convex, large, rounded on the sides and in front; antennae (Text-fig. 7) 16-jointed, 1st joint large, narrowed in the middle, 2nd half as long as 1st, narrowed at the base, 3rd nearly as long as 2nd, showing faint indication of division at the proximal third, 4th and 5th very little longer than 3rd.

Thorax: Pronotum much narrower than head, similar to that of soldier but slightly more rounded behind; mesonotum (0.94 wide) a little wider than pronotum and a little narrower than metanotum (0.99 wide).

* F. Silvestri. Die fauna Südwest Australiens, Isoptera, Bd. 2, No. 17, 1909.

Legs moderately long and stout, markedly setaceous; claws long and slender.

Abdomen large, widest in the middle, tapered to the bluntly pointed apex; cerci large, narrow at the base, setaceous.

Measurements:

Total length, 6.25 mm.

Head: base to apex of labrum, long 1.45; wide 1.14.

Thorax and abdomen, long 4.80.

Pronotum, long 0.47; wide 0.80.

Tibia iii., long 1.00.

Abdomen, wide 1.55.

Described from a small nest series comprising workers, soldiers and two alate imagos (3.9.21), eight imagos captured on the wing, and numerous other series comprising workers and soldiers only. From the collectors' notes it is evident that this species closely resembles *C. acinaciformis* Froggatt and *C. lacteus* Froggatt in its habits. It is probable that it is the species generally responsible for the destruction of fruit trees, vines, root crops, building timber, fence posts, etc., in Victoria, where it appears to be the predominant species of this genus. My collection of thirty nest series of *Coptotermes* from various parts of Victoria comprises twenty-nine series which I refer to the proposed new species and one series, from Rochester District, which may be referable to *C. lacteus*.

Through the courtesy of Mr. W. W. Froggatt, I have been able to compare *C. sedulus* with the types of *C. lacteus* Froggatt and *C. acinaciformis* Froggatt, from Shoalhaven, N.S.W., and Hall's Creek, N.W.A., respectively. In *lacteus* the head is hazel (Ridgway); it differs from *sedulus* otherwise in having a longer and broader head, larger pronotum, noticeably wider mesonotum and considerably longer (russet coloured) wings. *C. acinaciformis* is a markedly distinct species. Professor Silvestri has kindly examined the alate form of *sedulus* and has expressed the opinion that it is specifically distinct from both *lacteus* and *michaelseni*. The latter is the smallest of the Australian species and has two antennal joints less than *sedulus* in both imago and soldier. The heads of the soldiers of *sedulus* are markedly longer and more rounded than those of *michaelseni*, but shorter and narrower than those of *lacteus*. *C. raffrayi* Wasmann is a much larger and more robust species. The only remaining described Australian species is *C. australis* Walker, an inadequately described but apparently very distinct species from South Australia.

Types in the writer's collection; paratypes in the collections of Professors F. Silvestri and S. F. Light. *Locality.*—Victoria: Belgrave, Healesville, Lakes Entrance (F. E. Wilson), Ferntree Gully (F. P. Spry), Seaford, Riddell (W. F. Hill).

Eutermes fieldi, n.sp. (Text-figs. 8-13.)

Imago. (Text-figs. 8-10.)

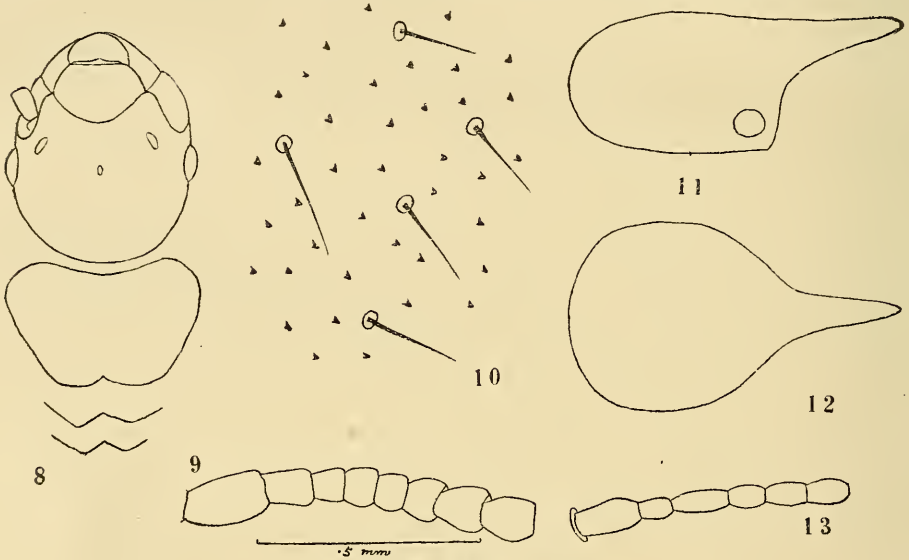
Colour: Head and thorax dark castaneous; clypeus, antennae, legs and tergites of abdomen brussels-brown, sternites a little lighter; wings light smoky, with dark costa and radius.

Head (Text-fig. 8) small, with scanty small pale setae (? abraded), broadly rounded behind, rather longer than wide, front concave; fontanelle small, indistinct, in line with middle of eyes; eyes moderately large (0.282) and projecting, situated near (.094) lower margin of head; ocelli small, narrow, widely separated from eyes; postclypeus very large and convex, more than half as long

as wide (0.330 x 0.565), arcuate behind, nearly straight in front; anteclypeus very short; labrum short and broad, hardly covering apex of mandibles; antennae (Text-fig. 9) of doubtful number of joints, 1st large, broad; 2nd half as long as 1st, narrowed at base; 3rd short, narrowest of all; 4th and 5th about as long as 3rd but wider; 6th longer and wider than 4th and 5th; 7th and 8th larger than 6th, equal; other joints missing.

Thorax (Text-fig. 8): Pronotum large, a little wider than head, anterior margin slightly raised, sides sloping back sharply to slightly emarginate posterior margin; meso- and metathorax with rounded sides and broadly emarginate posterior margin.

Wings: Wing-stumps small, equal, moderately setaceous, suture straight. Wings small; costa and radius dark, media indistinct except at base; cubitus with about 12 inferior branches, only the first four or five of which are distinct.



Eutermes fie'di, n.sp.

Text-figs. 8-10. Imago.—8. Head, pronotum, and posterior margin of meso- and metanotum; 9. antenna, proximal segments; 10. wing-membrane (greatly magnified).

Text-figs. 11-13. Soldier.—11. Head in profile; 12. head from above; 13. antenna, proximal segments.

Wing-membrane (Text-fig. 10) clothed with numerous small setae; sculpturing apparently in the form of minute blunt spines (visible under high magnification only).

Measurements:

Length: with wings 13.50; without wings 8.00 mm.

Head: from posterior margin to apex of labrum, long 1.70; at and including eyes, wide 1.22.

Pronotum: long 0.75; wide 1.24.

Wings: forewings, long 9.00, wide 2.35; hindwings, long 8.75, wide 2.60.

Tibia iii., long 1.50.

Abdomen, wide 2.25.

Soldier. (Text-figs. 11-13.)

Colour: Head uniform orange-rufous, thorax yellow-ochre, anterior half of pronotum darker than remainder, legs paler.

Head (Text-figs. 11 and 12) small, rounded behind in dorsal aspect, snout short, about half as long as remainder of head; antennae (Text-fig. 13) of doubtful number of joints, 1st long and moderately stout, 2nd short and narrow, half as long as 1st and very much narrower, 3rd very long and narrow, nearly as long as 1st and about as wide as 2nd, 4th a little longer and wider than 2nd, more rounded, 5th and 6th longer than 4th, subequal.

Pronotum small, a little more than half as wide as head, anterior half sharply bent up and narrowed anteriorly, posterior margin rounded, with hardly appreciable emargination; mesonotum much narrower than pronotum or metanotum.

Legs moderately long, slender.

Measurements:

Head: long 1.27-1.30 mm.; wide 0.75.

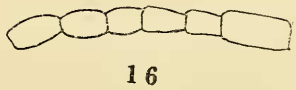
Pronotum: long 0.19; wide 0.47.

Mesonotum, wide 0.33.

Metanotum, wide 0.47.

Tibia i., long 0.66.

Affinities.—The imago of *E. fieldi,* n.sp. is very similar to that of *E. hastilis*



Eutermes tumuli Froggatt.

Text-fig. 14. Imago.—Wing-membrane (greatly magnified).
Text-figs. 15-16. Soldier.—15. Head in profile; 16. antenna, proximal segments.

Froggatt (identified for me by Mr. Froggatt from soldiers and workers only, collected at Stapleton, Northern Territory). It differs in having (1) the whole surface of the wing-membrane clothed rather densely with small setae (in *hastilis* the basal half of the wing is without setae excepting for a few on each of the veins; on the apical half the setae are more numerous, but not nearly so numerous as in *fieldi*); (2) slightly smaller and less prominent eyes; (3) ocelli smaller and more widely separated from the eyes; (4) larger postclypeus; (5) lighter coloured mouth-parts; (6) darker sternum, and (7) larger pronotum. The soldiers of these two species differ more markedly, *hastilis* having paler head and very slender snout. The imago of *fieldi* also resembles *E. tumuli* Froggatt (types compared). The wings of the latter are slightly larger and darker and the veins

are distinct throughout their length, the eyes are larger and the wing sculpturing entirely different (compare Text-figs. 10 and 14). The soldiers of *fieldi* and *tumuli* are easily differentiated by the antennae and the shape of the heads (compare Text-figs. 11 and 13 with 15 and 16).

Described from a series, comprising 4 alate imagos, several nymphs and eight soldiers in alcohol, from the South Australian Museum collection. The specimens are in poor condition but are sufficiently perfect to be adequately described.

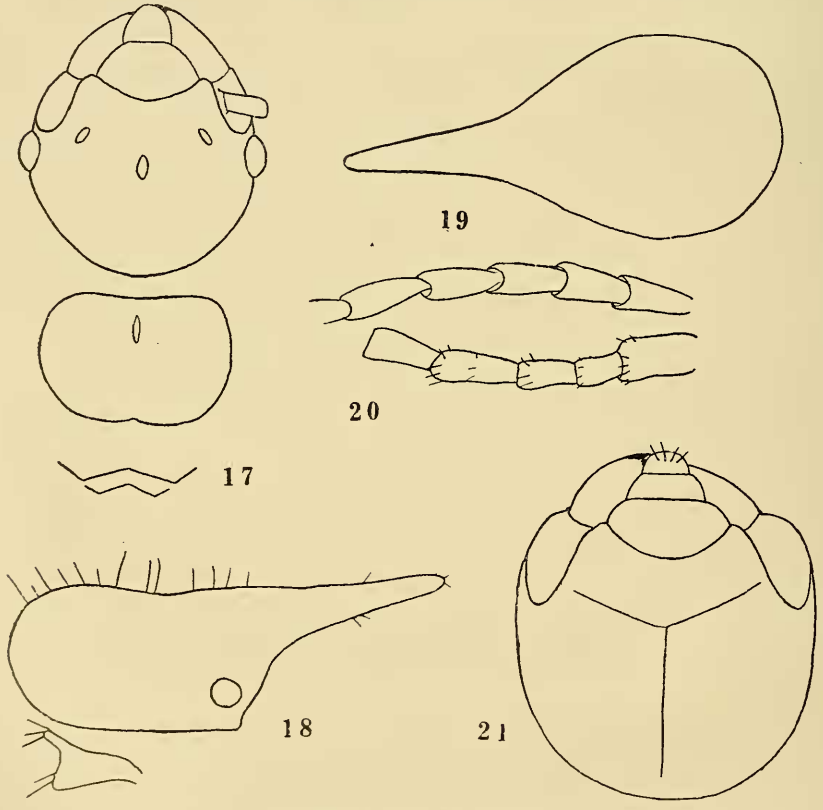
Types in the South Australian Museum; paratypes in the author's collection.

Locality.—Central Australia: Tennant Creek (J. F. Field, May, 1907).

EUTERMES TRIBULIS, n.sp. (Text-figs. 17-21.)

Queen. (Text-fig. 17.)

Colour: Head, thorax, wing-stumps and abdominal tergites auburn; clypeus



Eutermes tribulus, n.sp.

Text-fig. 17. Imago.—Head, pronotum, and posterior margin of meso- and metanotum.
Text-figs. 18-20. Soldier.—18. Head and pronotum in profile; 19. head from above; 20. antenna, ten proximal segments.
Text-fig. 21. Worker.—Head from above.

amber-brown; anteclypeus, mouth-parts, under surface and legs lighter.

Head (Text-fig. 17) moderately large, setaceous, hemispherical behind the eyes, clypeo-frontal suture markedly concave, fontanelle very large, elongate-oval.

about equidistant between clypeo-frontal suture and posterior margin of head; eyes small (0.235 diam.), prominent, separated from the lower margin of the head by a space of 0.140; ocelli large, oblique, very widely separated from the eyes; clypeus moderately large, four-sevenths as long as wide, clypeal suture straight, anteclypeus very short, slightly arcuate in front; labrum about as long as clypeus, hardly covering apices of mandibles; antennae (mutilated) with 2nd joint small, less than half as long as 1st, and much narrower, 3rd very small, smallest of all, 4th and 5th rounded, equal.

Thorax (Text-fig. 17): Pronotum nearly as wide as head and similarly clothed, anterior margin very slightly sinuate, sides rounded to the emarginate posterior border; meso- and metanotum with posterior margin sinuate (as shown in Text-fig. 17); wing-stumps of the mesonotum larger than those of the metanotum and not reaching the latter, surface setaceous, veins dark, suture straight.

Legs short and moderately stout, setaceous.

Abdomen: Tergites short.

Measurements:

Total length (about) 17.00 mm.

Head: from posterior margin to apex of labrum, long 1.50; from base to clypeo-frontal suture, long 0.90; at and including eyes, wide 1.31.

Pronotum: long 0.658, wide 1.034.

Tibia i., 0.94.

Soldier. (Text-figs. 18-20.)

Colour: Head and antennae uniform amber-brown, anterior margin of pronotum a little darker; thorax and legs buckthorn-brown. Head, thorax and abdomen scantily clothed with long and moderately stout setae.

Head (Text-figs. 18 and 19) long and slender, snout nearly as long as remainder of head, head slightly constricted on the sides and above; antennae (Text-fig. 20) 14-jointed, long and slender, 1st joint long and rather stout, 2nd about half as long as 1st and very narrow, 3rd longer than 2nd and about as wide, 4th as long as 1st, slender, 5th and 6th equal, a little shorter than 4th, 7th as long as or longer than 1st and 4th, remaining joints a little shorter than 7th.

Thorax: Pronotum very small, saddle-shaped, anterior half sharply bent up and darker in colour than posterior half, anterior margin fringed with long setae.

Legs long and slender, clothed scantily with long setae; claws very long and slender.

Abdomen clothed with markedly long and stout setae; cerci very long and slender.

Measurements:

Head: long 1.645 mm.; wide 0.730.

Pronotum: long 0.188; wide 0.470-0.517.

Tibia iii., long 1.270.

Worker. (Text-fig. 21.)

Colour: Head mummy-brown; clypeus and mouth parts buckthorn-brown.

Head (Text-fig. 21) large, broadly rounded behind, widest at the insertion of the mandibles, frontal and transverse sutures very distinct, clypeo-frontal suture markedly concave; clypeus small, not strongly convex, clypeal suture straight, anteclypeus small, straight in front; labrum small, rounded, not covering apices of the mandibles.

Thorax: Pronotum very small, saddle-shaped, anterior half bent up sharply, rounded in front, with deep emargination in middle, the whole surface with scattered stout setae.

Measurements:

Head: base to apex of mandibles, long 1.645 mm.; base to clypeo-frontal suture, long 1.222; wide 1.550.

Tibia iii., long 1.410.

The specimens at my disposal are in poor condition, but as all the castes are represented and the species is a very distinct one I have not hesitated to describe it as new.

Described from a series comprising one true queen, one neoteinic queen, about twelve soldiers and one worker, from the South Australian Museum collection.

Types in the South Australian Museum; paratypes in the writer's collection.

Locality.—Central Australia: Tennant Creek (J. F. Field)